Financial integration, investor protection and imbalanced optimistically biased information timeliness in emerging markets

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Financial Integration, Investor Protection and Imbalanced Optimistically Biased Information Timeliness in Emerging Markets

Abstract

Principal-principal conflicts in many emerging markets can lead to an optimistically biased information environment. Using 24 emerging markets during the period 1996-2016, this paper examines how market-level, firm-level financial integration and investor protection quality jointly affect Imbalanced Optimistically Biased Information Timeliness (IOBIT). Results show that financial integration and investor protection quality affect good and bad information timeliness asymmetrically. Market-level financial integration augments IOBIT while firm-level financial integration and investor protection mitigate IOBIT. The effect of firm-level financial integration in mitigating IOBIT is reduced when market-level financial integration increases and/or investor protection becomes stronger. Our analysis enhances our understanding of the benefit-cost trade-off associated with financial integration in affecting information timeliness and the conditional factors in altering this benefit-cost trade-off in emerging markets.

JEL Classification: F36; G14; G15; G28; G30

Keywords: Financial Integration, Investor Protection, Information Timeliness, Emerging Markets

1. Introduction

Balanced information timeliness is crucial for stock market efficiency and investor protection. It reflects not only the balanced amount of good and bad forward-looking, value-relevant information, but also the balanced timely manner of these to be communicated to market participants and then incorporated into price (Beekes et al., 2014, 2016)[1]. It is the result of the joint efforts of managers and market participants in forward-looking information collection, communication and verification, which complement financial statements and inform investors about the firm prospectus (Feldman et al., 2010; Merkley, 2014).

However, agency conflicts lead to an optimistically biased information environment (Shleifer & Vishny, 1997 Kothari et al., 2009), especially in terms of forward-looking information because it is qualitative in nature, non-time specific, and difficult to verify[2] (Schleicher & Walker, 2010). In many emerging markets (EM), share prices are quite often inflated (Dyck & Zingales, 2004; Khurana et al., 2013; Zhang et al., 2013, 2015, 2017; Ang & Ma, 2001), suggesting information timeliness in many emerging markets is biased towards good, relative to bad, i.e. Imbalanced Optimistically Biased Information Timeliness (IOBIT). Given this background, we know little about the impacts of financial integration on agency conflicts in general, and in particular on IOBIT. This paper fills the conceptual and empirical gaps by examining how market-level and firm-level financial integration and investor protection quality jointly affect IOBIT in emerging markets.

[1] Forward-looking information can be communicated with investors via many forms of voluntary disclosure such as conference calls, earnings warnings and narrative reporting in annual reports (Feldman et al., 2010; Merkley, 2014).

[2] Indeed, International Accounting Standard Board (IASB) concerns on forward-looking information credibility, which may add noise so as to "make the more important information difficult to find" (IFRS, 2010, P. 12).

The elimination of market-level investment barriers by policy makers and regulators, and firm-level investment barriers by controlling shareholders take place independently in many emerging markets (Harvey, 1995; Kang & Stulz, 1997; Mitton, 2006; Claessens & Schmuckler, 2007; Li et al., 2015). When market-level investment barriers are eliminated by policy makers, firm-level investment barriers can be maintained by controlling shareholders to protect their own private benefits, which further stimulates foreign investor's home bias problems[3]. In contrast, when market-level investment barriers are maintained by policy makers and regulators, firm-level investment barriers can be eliminated by controlling shareholders if they actively engage in global asset and information connections to delink their firms from their sovereign and country risks (Lee et al., 2016). Given these decisions are independent, a firm from an emerging market can therefore choose not to engage, to engage with either market- level or firm- level financial integration, or to engage with both. Based on this independence, we argue that principal-principal conflicts and IOBIT may increase, as the cost of market-level financial integration, if the global information asymmetry between large and minority shareholders is enlarged in an EM country by market-level financial integration. In contrast, firm-level financial integration may mitigate the information asymmetry between large and minority shareholders within the firm and thus bring benefits in mitigating principal-principal conflicts and IOBIT.

Our study focuses on emerging markets for two reasons. First, an imbalanced and optimistically biased information environment can be corrected in advanced markets where institutional environments are strong and sophisticated market participants drive

[3] First, many emerging market firms engage in financial integration at market level but do not eliminate firm-level investment barriers (Mitton, 2006; Li et al., 2015). Second, there is equity home bias, whereby foreign investors only hold modest amounts of foreign equity assets (Harvey, 1995; Zhang et al., 2017), even when there are no regulation restrictions on cross-border asset holding (Kang & Stulz, 1997).

stock prices to fundamentals through informed trading, dependent on corporate managerial actions (Admati & Pfleiderer, 2009; Edmans & Manso, 2011; Ferreira et al., 2011; Beekes et al., 2016). In contrast, many emerging markets are more likely to suffer poor information timeliness and serious IOBIT due to the weak institutional environment, poor disclosure quality and lack of sophisticated market participants, coupled with less effective informed trading (Aslan & Kumar, 2014; Zhang et al., 2015; 2017). Thus the potential benefit-cost trade-off on information timeliness associated with financial integration is amplified in emerging markets. Second, globalization has increased significantly during the last decade, leading to greater capital flows into emerging markets (Liu et al., 2014) and increased financial integration of emerging markets with advanced markets. However, the benefits and costs of financial integration to emerging markets are under debate. On one hand, financial integration is expected to import foreign sophisticated market participants into emerging markets, improve informed trading and strengthen market discipline over management (Aggarwal et al., 2011; Bae & Goyal, 2010; Lucey & Zhang, 2011; Huang & Zhu, 2015). On the other hand, financial integration is accused of triggering a series of price volatility and financial crises in emerging stock markets (Li et al., 2015; Graham et al., 2015; Dvokak, 2005).

Our contributions to financial integration and corporate governance literature are threefold. First, we focus on the benefit-cost trade-off associated with financial integration in affecting optimistically biased information timeliness in emerging markets. Our analysis helps to understand how market-level and firm-level financial integration differently affect the outcome of forward-looking information collection, communication and verification between managers and market participants. By revealing the different impacts of market-level and firm-level financial integration on IOBIT, our analysis helps

to explain the mixed results on the benefit-cost trade-off associated with financial integration documented in the literature. The different impacts on IOBIT associated with market-level and firm-level financial integration also suggests that agency problems may be the reason that market-level financial integration does not necessarily lead to firm-level financial integration, extending Bekaert et al. (2011).

Second, we contribute to corporate governance literature on optimal bundles of governance mechanisms in mitigating agency costs (Aslan & Kumar, 2014) by revealing that firm-level, market-level financial integration and investor protection standard work as substitutive governance bundles in mitigating principal-principal conflicts and IOBIT. Our results show that high levels of market-level financial integration and investor protection quality weaken the impacts of firm-level financial integration in mitigating IOBIT in emerging markets. The implications for policy makers are provided and discussed in our research.

Finally, financial integration and corporate governance reform are an important agenda in many emerging markets to improve investor confidence and promote stock market development. By focusing on 24 emerging markets from 1996-2016, we extend previous research from advanced markets into those where IOBIT largely remains uncorrected and firms have very different motivations to engage with market- or firm-level financial integration.

The remainder of our paper is organized as follows. In Section 2, we describe the most closely related literature and formulate our predictions. Section 3 describes the data and variables and Section 4 presents the results. Concluding remarks are made in Section 5.

2. Literature review and hypothesis development

2.1. Principal-principal agency problems, financial integration, and information timeliness in emerging markets

In many emerging markets, share ownership is often concentrated into large shareholders so that they have the power and incentive to mitigate the classic principal–agent conflicts in weak institutional environments (Claessens & Fan, 2002). However, powerful shareholders in weak institutional environments also have strong incentives to extract private benefits at the cost of uninformed minority investors, stimulating principal–principal conflicts (Dyck & Zingales, 2004; Claessens & Fan, 2002; Zhang et al., 2015). In the presence of the principal-principal conflicts, large shareholders have incentives to keep the information environment of their firm opaque and optimistically biased (Zhang et al., 2013, 2015; Khurana et al., 2013; Kothari et al., 2009). Thus, minority shareholders suffer from the presence of large controlling shareholders (Claessens & Fan, 2002).

Many firms from emerging markets engage in market-level financial integration without elimination of firm-level investment barriers (Mitton, 2006; Li et al., 2015). Market-level financial integration brings benefits to emerging markets such as reduced cost of capital (Bekaert & Harvey, 2000), increased real investment (Mitton, 2006; Chari & Henry, 2008) and enhanced productivity and growth (Bekaert et al., 2005). With the opportunities of market openness, large shareholders may have strong incentives to reap these benefits in order to boost their share price and concentrate wealth in the company (Claessens & Fan, 2002; Zhang et al., 2013).

However, principal-principal conflicts provide strong incentives for large shareholders (and their controlled managers) to abuse their advantages of accessing global information over minority shareholders arising from their power to decide whether, when, and how their controlled firms engage in market-level financial

integration. Thus the benefits related to market-level financial integration may be covered by imbalanced disclosure and tunnelled away into large shareholders' own private benefits, leading to an optimistically biased information environment (Ang & Ma, 2001; Kothari et al., 2009; Zhang et al., 2013; 2017; Ferreira et al., 2011). Consequently, a large amount of good global forward-looking information related to the benefits of market-level financial integration can be signalled and incorporated to market in a more timely manner, but bad global forward-looking information related to large shareholders' private benefit extractions can be delayed or even suppressed from the market (Kothari et al., 2009; Zhang et al., 2013; 2017).

Based on the analysis above, we expect that market-level financial integration increases IOBIT in emerging markets. It is not clear though, whether, or not, market-level financial integration affects aggregate information timeliness, which depends on the net outcome between good and bad information timeliness. Specifically, we test the following hypotheses:

H1: Market-level financial integration does not affect aggregate information timeliness in emerging markets.

H2: Market-level financial integration increases imbalanced optimistically biased information timeliness in emerging markets.

Firm-level financial integration, by importing sophisticated foreign market participants into firm-level monitoring and disciplining over management, can mitigate the global information advantages associated with large shareholders over minority shareholders (Albuquerque et al., 2009; Dvokak, 2005). In comparison to domestic counterparts in emerging economies, foreign investors are more experienced and sophisticated (Ng & Wu, 2007), less subject to political pressures and better informed in

terms of global information (Kim & Yi, 2015). Thus they are more capable of influencing financial reporting practices (Fang et al., 2015) and more likely to discipline management due to their informed status and independent role (Bae et al., 2012; Huang & Zhu, 2015; Zhang et al., 2017). Following their investments, sophisticated foreign market participants are found to be able to continue to shape investee firms' voluntary disclosure (Tsang et al., 2019), which is an important mechanism in forward-looking information communication. Therefore, firm-level financial integration should be able to affect the outcome of global forward-looking information collection, communication and verification between managers and market participants.

Financial integration at firm-level makes emerging market firms directly communicate with foreign shareholders, placing large controlling shareholders and managers under the direct scrutiny of these foreign shareholders. The direct scrutiny of foreign shareholders over good forward-looking information strengthens the verification process until this become credible. This further verification process prevents un-reliable good forward-looking information from being incorporated into price by unsophisticated market participants, and ultimately reduces the information timeliness for good forward-looking information.

On the other hand, large shareholders face high threat of legal or regulatory penalties in delaying or suppressing bad forward-looking information, especially for those cross-listing their shares in advanced markets and invested by foreign investors from countries with strong investor protection standards (Baker et al., 2002; Watts, 2003; Ball & Shivakumar, 2005; Kothari et al., 2009). In addition, foreign investors with their informed status and independent role, will engage in pre-emptive trading when they detect any suppressed or delayed bad forward-looking information related to market-level financial integration (Lang et al., 2003; Gul et al., 2010; Admati & Pfleiderer,

2000). Such pre-emptive trading by foreign investors on bad forward-looking information in order to protect their own investment ultimately speeds up the information timeliness for bad forward-looking information which controlling shareholders have strong incentives to suppress from the market.

Based on the analysis above, we expect that firm-level financial integration directly mitigates IOBIT in emerging markets. It is not clear, however, whether, or not, firm-level financial integration affects aggregate information timeliness. This depends on whether and how the impacts of good and bad information timeliness are offset by each other.

In addition, the effects of firm-level financial integration on imbalanced optimistically biased information timeliness can be various, conditional on the incentives of foreign investors in disciplining large shareholders. Such incentives will be affected by benefit and cost associated with disciplining activities conducted by foreign investors. On one hand, the benefits of market participants in disciplining large shareholders can increase with the threat of exploitation by large shareholders (Bae & Goyal, 2010; Zhang et al., 2015, 2017). For example, Covrig et al. (2007) show that in countries following International Accounting Standards, foreign mutual fund holdings have stronger interests in investing in firms with poorer information environments and with lower visibility. On the other hand, the information and monitoring costs to foreign investors increase in an opaque information environment, which may reduce their incentives in disciplining activities (Ayers et al., 2011).

As argued earlier, high market-level financial integration potentially stimulates principal-principal conflicts by augmenting global information asymmetries between large and minority shareholders. Therefore, to protect their investments, the incentives of

foreign shareholders in monitoring and disciplining large shareholders may be stronger in countries with high levels of financial integration at market level.

However, the monitoring costs in mitigating the global information asymmetries between large and minority shareholders become higher for foreign investors when global information asymmetries are augmented by increased market-level financial integration. This is because there is much more information to be collected, produced, and verified and this is further complicated by the geographic separation from investee firms, differences in language, culture, legal and regulatory environments, and accounting standards (Baik et al., 2013). Therefore, high market-level financial integration can potentially weaken foreign investors' monitoring incentives. We argue that in emerging markets with increasing market-level financial integration, the increasing costs for foreign investors to mitigate global information asymmetries can be the dominating factor in shaping their incentives to discipline controlling shareholders. Specifically, we test the following hypotheses:

H3: Firm-level financial integration does not affect aggregate information timeliness in emerging markets.

H4: Firm-level financial integration mitigates imbalanced optimistically *biased information timeliness in emerging markets.*

H5: Firm-level financial integration has smaller impacts in mitigating the imbalanced optimistically *biased information timeliness when market-level financial integration increases in emerging markets.*

2.2. Investor protection standards, financial integration, and information timeliness in emerging markets

Strong investor protection helps to 'level the field' by imposing high legal and

regulatory standards on firm information disclosure (Admati & Pfleiderer, 2000; Leuz et al., 2003; Aslan & Kumar, 2014), especially on forward-looking information disclosure areas (Baginski et al., 2002) due to their credibility issues (Schleicher & Walker, 2010). To protect investors from being misled by good forward-looking information, strong investor protection standards can hold managerial disclosure until to a stricter time frame allowing information verification and ensuring its credibility. It also strengthens the threat of legal or regulatory penalties for failure to report, immediately, bad information, even though the information may be still forward-looking in nature. Thus strong investor protection standards are expected to mitigate IOBIT.

Given both strong investor protection standards and firm-level financial integration are expected to correct the imbalanced optimistically biased information timeliness, it is not clear investor protection quality and firm-level financial integration, as the two discipline mechanisms, are complementary to, or substitutive with, each other in mitigating global information asymmetry related agency problems. Both investor protection policy and foreign investors have the shared aims to discipline large shareholders and protect investor interests, foreign investors may have stronger grounds and incentives to secure monitoring benefits in countries with stronger investor protection standards, i.e., a potential complementary relationship between them (Lucey & Zhang, 2011).

However, the incentives of foreign investors in disciplining activities and mitigating global information asymmetries can decrease when investor protection quality reduces large shareholders' incentives in maintaining global information asymmetries and minor shareholders have improved access to global information. This reduces the global information advantages of foreign investors over domestic investors, who now

benefit from their closeness with large shareholders in geographic, cultural, language and institutional backgrounds to process, verify and trade upon this information (Baik et al., 2013). Thus strong investor protection reduces the demand on foreign sophisticated participants to provide their costly monitoring service to domestic minority investors. Ultimately, foreign investors by losing their global information advantages over domestic counterparts, have reduced benefits to discipline large shareholders and ultimately, have reduced incentives to mitigate global information asymmetry related agency problems. If the reduced benefits of, rather than the stronger grounds provided to foreign investors in mitigating global information asymmetries, are the dominating factor in shaping their incentives to discipline controlling shareholders, we expect firm-level financial integration and investor protection policy are substitutive with each other in affecting IOBIT. Specifically, we test the following hypotheses:

H6: Investor protection standards do not affect aggregate information timeliness in emerging markets.

H7: Investor protection standards mitigate imbalanced optimistically biased information timeliness in emerging markets.

H8: Investor protection quality weakens the impacts of firm-level financial integration in mitigating the imbalanced optimistically biased information timeliness in emerging markets.

3. Data and Variables

3.1. Sample selection

Our sample is from 24 emerging markets during the period 1996 to 2016. To reduce survivorship bias, we include companies delisted during the sample period. We exclude firms with missing data. We also exclude financial firms (SICs between 6011

and 6799) due to their unique accounting and financial characteristics. The selection process results in a final sample of 110,583 firm-year observations. We obtain share price and financial data from Datastream and Worldscope. Data for market-level financial integration measurement is from Chinn and Ito (2006), Federal Reserve Economic Data and Thomson Reuters Eikon. Data for firm-level financial integration measurement is from Bank of New York Mellon and Thomson Reuters Eikon. Data for investor protection standards and other country-level financial and macroeconomic variables is from World Bank (World Bank, 2013).

3.2. Measuring information timeliness

The measure of information timeliness (IT) is derived from Beekes and Brown's (2006) approach who employ a novel intra-year timeliness metric, in the spirit of Ball and Brown (1968) and Alford et al. (1993). That is the timeliness with which a firm's share price reflects the net effect of all value-relevant information impounded by all market participants in share price over the year, i.e. the intra-year timeliness (Beekes & Brown, 2006). Ball and Brown's measure assesses how accurately a firm's share price (P_t), observed at daily intervals throughout the year, approximates its terminal value (P_0). Thus this information timeliness measurement metric simultaneously captures the amount of forward-looking information and the timely manner of this information to be incorporated into price throughout the year.

In line with earlier literature we define P_0 to be the market's valuation two weeks (14 calendar days) after the annual earnings release date. Specifically, we calculate the information timeliness (IT) as

$$IT = (\sum_{t=-365}^{t=-1} |\ln(P_0) - \ln(P_t)|)/365 \quad (1)$$

where Pt is the market-adjusted share price, which is observed at daily intervals from day -365 until day -1, and P_0 is the price 14 days after the release date[4].

Because idiosyncratic volatility inflates the IT measure when it is calculated at the individual firm-year level, following Beekes and Brown (2006) we also generate a metric for information timeliness deflated version (ITD), which is the timeliness metric divided by one plus the absolute rate of return on the share over the 365-day period used to calculate the share's timeliness metric. The longer it takes a firm's share price to capture information and converge to its "final" price P_0 (which reflects all forward-looking value-relevant information discovered during the year), the larger is the value of IT. A high value for IT thus indicates low intra-year timeliness. In contrast, if all the information that affects the final price was incorporated on day -365, IT would be at its minimum and the speed of price adjustment at its maximum (i.e. most timely information). We can interpret IT as a measure of how much forward-looking value-relevant information is, on the average day, already incorporated into the price before prices finally 'settle' following the release of the firm's annual earnings number.

We use the approach discussed in Beekes and Brown (2006) to calculate two additional measures of timeliness: information timeliness of good news (ITG), and information timeliness of bad news (ITB). For the timeliness of good information, we first identify the third quartile of the share's raw (unadjusted) daily log returns, r_t, that are positive. Then we construct a market-adjusted daily log return series, $r_t^G \geq 0$. If the day's return is less than zero, we set the good news return on that day to zero. We next

[4]Timeliness is measured in calendar time, to facilitate international comparisons since the number of trading days in a year differs by country. Prices are forward-filled on days when the market was closed (e.g., on weekends and holidays), or when there was no trading in the stock. We set the ending date to be fourteen days after the earnings release date because the market may need time to absorb information (Beaver, 1968). The difference between our measure and Beekes and Brown's (2006) is the 0.5 adjustment difference, which is a pure technical adjustment difference, and does not affect our results. As robustness checks, we estimate the timeliness measures using 0, 7, and 21 days lags and find similar results.

create a cumulative log return series, C_t^G, by setting $C_{-365}^G = 0$, and constructing the good news return series as $C_t^G = C_{t-1}^G + r_t^G$ from day -365 to day -1. The timeliness of good news is thereby:

$$ITG = ((\sum_{t=-365}^{t=-1}(C_0^G - C_t^G)/C_0^G)/365 \quad (2)$$

The raw (unadjusted) returns are filtered at the third quartile to mitigate noise in identifying the nature of forward-looking information (e.g., form bid-ask bounce). We follow Beekes et al. (2014, 2016) and choose the third quartile as the filter. The information timeliness of bad news is defined in a similar fashion. Thus the imbalanced and optimistically biased information timeliness (IOBIT) is measured with the ratio of ITG divided by ITB. When the ratio equals to 1, it suggests that good and bad information is incorporated into share price in a similar timely manner, thus balanced information timeliness. When the ratio is below 1, it suggests that information timeliness is imbalanced and optimistically biased. An increasing ITG with a decreasing ITB, or a greater increase in ITG than in ITB, or a greater reduction in ITB than in ITG, can lead to an increase in IOBIT. Higher values of IOBIT indicate less optimistically biased information timeliness.

$$\text{IOBIT= ITG/ITB} \quad (3)$$

3.3. Measuring market-level financial integration

Given market-level financial integration is a gradual and reversible process, we gauge financial integration at market levels via a de-jure measure as well as a more accurate de-facto measure with time-varying and regime-switching characteristics. De-jure measures emphasize changes in policy and legal controls on cross- border capital flows. Capital controls take many forms, including controls on inflows versus controls on outflows, quantity controls versus price controls, or restrictions on foreign equity

holdings. The imposition/relaxation of these controls reflects the dynamics of a country's financial market openness. We adopt the de-jure market-level financial integration index developed by Chinn and Ito (2006), labeled as DJFI in our study. The index, widely used in literature to capture market-level financial integration (e.g., Umutlu et al., 2010), aims at measuring the extent of openness in capital controls based on information in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). Higher values of the index indicate greater openness of a country to cross-border capital transactions.

However, various restrictions associated with foreign exchange transactions may not necessarily impede capital flows so that the actual degree of openness of the capital market and the de-facto market-level financial integration can be different from de-jure market-level financial integration. In addition, de-facto market-level financial integration can be more time-varying than the de-jure measure with less time-varying changes in policy and legal controls on cross- border capital flows. To measure de-facto time-varying market-level financial integration (DFFI), we follow Baele and Inghelbrecht (2010) and adapt their estimation procedure to capture a price-based market-level financial integration measure.

DFFI is estimated by taking the annual average of the weekly $\beta_{i,t}^{W}$ estimates, which varies through time due to the change in economic and financial condition of an emerging market relative to the global market, it also exhibits regime-dependent behaviors according to business cycle in expansion or contraction.

Specifically, we first extract global shocks using MSCI world index, and model its returns as:

$$r_{W,t} = \gamma_{W,0} + \boldsymbol{\gamma}_{W}\boldsymbol{Z}_{t-1}^{W} + e_{W,t} \quad (4)$$

where Z_{t-1}^{W} is a vector of lagged variables consist of the MSCI global index return, the US 3-Month constant maturity treasury yield, the US 10-Year minus 3-Month constant maturity treasury yield spread, Moody's seasoned Baa corporate bond yield minus 10-Year constant maturity treasury yield spread, and the S&P 500 index dividend yield. The global shock is modelled by stochastic volatility model with its conditional variance generated by a regime-switching GJR-GARCH (1,1) process:

$$e_{W,t} \sim N(0, \sigma_{W,t}^2)$$

$$\sigma_{W,t}^2 = \theta_{W,0}(S_{W,t}) + \theta_{W,1}(S_{W,t})e_{W,t-1}^2 + \theta_{W,2}(S_{W,t})\sigma_{W,t-1}^2 + \theta_{W,3}(S_{W,t})e_{W,t-1}^2 I_{\{e_{W,t-1}<0\}} \quad (5)$$

where $I_{\{e_{W,t-1}<0\}}$ is the indicator function, and $S_{W,t}$ is the latent regime variable. This specification closely mimics the empirical evidence that equity return volatility is stochastic, mean reverting, asymmetrical to positive and negative return shocks, and subject to multiple regimes.

We then use MSCI indices to represent the financial market of a particular country, and decompose the market return $r_{i,t}$ of country *i* at time *t* to its expected and unexpected components:

$$r_{i,t} = \mu_{i,t-1} + \beta_{i,t}^{W} e_{W,t} + e_{i,t}$$

$$e_{i,t} \sim N(0, \sigma_{i,t}^2)$$

$$\sigma_{i,t}^2 = \theta_{i,0} + \theta_{i,1}e_{i,t-1}^2 + \theta_{i,2}\sigma_{i,t-1}^2 + \theta_{i,3}e_{i,t-1}^2 I_{\{e_{i,t-1}<0\}} \quad (6)$$

where $\mu_{i,t-1}$ denotes the expected return of country *i* at $t-1$, and is assumed to be a linear function in elements of $\boldsymbol{Z}_{t-1}^{W}$, short rates and lagged MSCI index return of country *i*, and a constant. We assume that the unexpected return of country *i* consists of two elements: 1) country-specific financial market shock $e_{i,t}$, and 2) financial market shock

due to global shock $e_{W,t}$. One can therefore interpret $\beta_{i,t}^{W}$ as the time-varying sensitivity or exposure of country *i*'s financial market to the global financial market shocks. We therefore further assume that $\beta_{i,t}^{W}$ takes the form:

$$\beta_{i,t}^{W} = \beta_{i,0}^{W}(S_{i,t}) + \boldsymbol{\beta}_{i}^{W}\boldsymbol{X}_{i,t-1}^{W} \qquad (7)$$

where $S_{i,t}$ denotes the latent regime variable and $\boldsymbol{X}_{i,t-1}^{W}$ is a vector of structural variables that capture the economic and financial conditions of country *i* relative to global economy and financial market. We follow Baele and Inghelbrecht (2010), and use trade integration and sector misalignment as structural variables. Trade integration is calculated as the ratio of import and export over GDP, and sector misalignment is calculated by taking the square root to the sum of squared differences of relative industry composition between the world and a specific country.

Using weekly returns, we first estimate the global shock by Gray (1996) filter, this is then used to estimate the regime-switching $\beta_{i,t}^{W}$ using Hamilton (1989) filter. To avoid local optimal and corner solutions, we conduct maximum likelihood estimation using a genetic algorithm assisted global search algorithm. The estimation procedure is conducted several times to ensure consistency.

3.4. Measuring firm-level financial integration

We measure firm-level financial integration via foreign ownership (FFIFO) and via cross-listing status (FFICL), following previous research (Werner & Kleidon, 1996; Mitton, 2006; Claessens & Schmuckler, 2007; Gozzi et al., 2010; Li et al., 2015). FFIFO is the shareholding held by foreign portfolio investors identified by Thomson Reuters Eikon. FFICL is a dummy variable, equal to 1 if the firm's shares are cross-listed and traded on a foreign stock exchange through Depository Receipts (DR), and zero

otherwise. Data on firms cross-listed on the U.S. exchange is obtained from the Bank of New York Mellon's website. The dataset includes the name of the company issuing the DR, the DR's trading symbol, the country in which the DRs are registered, the DR type, the primary exchange, the DR listing exchange and the effective date of issue.

3.5. Measuring investor protection standards

Following Nguyen et al. (2015) and Van Essen et al. (2013), we single out three indicators of national governance quality out of the six dimensional World Governance Indicators (WGIs), namely government effectiveness, regulatory quality, and the rule of law, to measure investor protection standard (IPS)[5]. These three indicators are found to be most related to firm operations (Nguyen et al., 2015; Van Essen et al., 2013; Zhang et al., 2017). The indicators are displayed in standard normal units ranging from −2.5 to +2.5, with more positive values indicating better national governance quality (Kaufmann et al., 2011). The indicators are highly correlated, hence, in line with Knudsen (2011), the three indicators are combined to form an aggregate national investor protection standard index, IPS = Government Effectiveness + Regulatory Quality + Rule of Law[6].

As suggested by prior literature (e.g., Leuz et al., 2003; Beekes et al., 2016), it is likely that the variation in information timeliness depends on market differences between

[5] These World Governance Indicators (WGIs) are the most widely-used indicators in multi-country comparative studies (Nguyen et al., 2015; Van Essen et al., 2013; Kaufmann et al., 2011) and cover six dimensions of national governance quality including: voice and accountability; political stability and absence of violence/terrorism; government effectiveness; regulatory quality; rule of law; and control of corruption. According to Kaufmann et al. (2011, p. 4), the Government Effectiveness index captures "the quality of public services, the quality the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies". The Regulatory Quality index captures "the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development". The Rule of Law index captures "the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence".

[6] We also construct an alternative measure and use factor analysis to construct a proxy for investor protection standards by extracting the first principal component of the three above-mentioned indicators of national governance quality. The results remain robust.

countries. We include five variables to control for the economic, information, and institutional environment of a country. These variables, explained in more detail in Table 1, include: the ratio of total value of stock traded over GDP (STOCKGDP); an information flow index (IFI); a dummy variable of legal origin coded 1 for firms from a country with Common Law tradition, and zero otherwise (COMMON); the annual percentage change in the consumer price index (CPI); and the natural logarithm of GDP per capita (GDPPC).

We also include six firm-level control variables which may affect information timeliness (Lev & Penham, 1990; Beekes & Brown, 2006; Beekes et al., 2014, 2016; Zhang et al., 2015). These variables, explained in more detail in Table 1, include firm size (SIZE), profitability (PROFIT), financial leverage (LEV), the ratio of book to market value to proxy growth opportunities (BM), volatility (VOL), and the structure of informational environment (SIE).

3.6. Empirical Models

To examine the effects of financial integration on information timeliness, we use the following regression models. Because we have time-invariant variables in our analysis, which prevent us from controlling firm level fixed effects, we include country, year and industry fixed-effects but address firm level fixed-effects by clustering standard error at a firm level.

$$T_{it} = \alpha + \alpha_c + \alpha_s + \alpha_t + \beta_1 FINITI_{ct} + \beta_2 IPS_{ct} + \beta_3 STOCKGDP_{ct} + \beta_4 IFI_{ct} + \beta_5 COMMON_c + \beta_6 CPI_{ct} + \beta_7 GDPPC_{ct} + \beta_8 SIZE_{it} + \beta_9 PROFIT_{it} + \beta_{10} LEV_{it} + \beta_{11} BM_{it} + \beta_{12} VOL_{it} + \beta_{13} SIE_{it} + \varepsilon_{it} \quad (8)$$

The subscripts *i*, *c*, *s* and *t* stand for firm, country, industry and year, respectively; α_c, α_s and α_t are the country, industry and year dummy variables. T stands for

information timeliness related variables (i.e. IT, ITD, IOBIT, ITG or ITB). FINITI represents the financial integration related variables (i.e., DJFI, DFFI, FFIFO, or FFICL).

[Insert Table 1 about here]

4. Empirical Results

4.1. Summary statistics and univariate analysis

Figures 1 to 7 present the time series of our key variables from 1996 to 2016 for each of the 24 emerging markets. The overall trend for the value of information timeliness (deflated information timeliness) across all 24 markets is decreasing, as shown by the last graph, labeled as Total in Figure 1 (Figure 2). This indicates that information timeliness improves during the period of 1996-2016 in these emerging markets. However, the overall aggregate information timeliness can be imbalanced and optimistically biased in these emerging markets during the period, as revealed by the IOBIT shown in Figure 3 (which quite often can be below 1 during our sample period), in line with previous findings documented in the literature (Aslan & Kumar, 2014; Zhang et al., 2015, 2017). There is significant variance of market-level financial integration in these emerging markets, as shown in Figure 4 and 5. Despite de-jure market-level financial integration remaining stable during 1996-2016 in a given market such as China and India, de-facto market-level financial integration is time-varying, indicating the importance of measuring market-level financial integration in these two different dimensions.

Built on previous literature suggesting frontier markets show low integration with the world market through time (Berger et al., 2011), we find the frontier markets in our sample including Argentina, Jordan and Morocco show very unstable trends in their financial integration through time. Particularly, these frontier markets show decreasing

integration between 2005 to 2016, as revealed by Figure 5-A. In contrast, other emerging markets show a more stable and increasing integration trend through time. When we separate emerging markets into two groups, BRICS and non-BRICS groups, we find the increasing integration through time associated with emerging markets is largely driven by BRICS markets. However, financial integration level of BRICS markets drops to a much lower level in the last two years, 2015-2016, indicating de-facto market-level financial integration is reversing.

There is a generally increasing trend for firms to become cross-listed in advanced markets during 1996-2016, as shown in the last graph, labeled Total, in Figure 5. Despite FFICL remaining stable during 1996-2016 in a given market such as Morocco (as shown in Figure 6), FFIFO is more dynamic and volatile, as shown in the last graph, labeled Total in Figure 7. Again this shows the importance of measuring firm-level financial integration in these two different dimensions.

[Insert Figure 1-7 about here]

Table 2 presents the statistics for our variables. Despite that, on average, IOBIT of a firm in our sample is insignificantly different from 1 (mean=1.013, SD=0.158). Most of firms in emerging markets can have significantly imbalanced and optimistically biased information timeliness. This is revealed by the positive skewness of IOBIT, which is 0.524, suggesting that the IOBIT of most of the firms in our sample fall toward the lower side of the scale. Despite that DJFI is low (mean=-0.291, SD=1.121), DFFI seems to be high (mean=0.753, SD=0.219). On average, 3.31 percent of firms in our sample choose to cross-list their shares in advanced markets and foreign ownership is only 8.95 percent. In emerging markets, firm-level financial integration can be low, in line with previous research (Mitton, 2006; Zhang et al., 2017). Investor protection standards in emerging markets show low values (mean=0.791) with huge variances (SD=1.616) across them.

[Insert Table 2 about here]

The correlation coefficients of variables are provided in Table 3. As Table 3 shows, there is no high correlation among any two explanatory variables to be included in regression models. Thus multi-collinearity is not a major concern for our analysis. As shown in Table 3, IOBIT has a low and positive correlation with IT and ITD. This suggests that these are two independent dimensions of information environment in emerging markets. In other words, in emerging markets, it is important to investigate IOBIT to reveal the potential serious agency problems which are covered by a timely but optimistically biased information environment. The correlation analysis between market-level and firm-level financial integration shows a very low correlation (absolute value of the correlation <0.1), suggesting that there are two almost independent dimensions of financial integration, i.e., a country or market-level opening decision is independent of a firm-level opening decision.

[Insert Table 3 about here]

4.2. Multivariate analysis

Table 4 presents the results of estimating Equation (8). The dependent variables in column 1-5 are information timeliness (IT), information timeliness deflated (ITD), imbalanced and optimistically biased information timeliness (IOBIT), information timeliness for good news (ITG) and information timeliness for bad news (ITB), respectively[7].

Regarding market-level financial integration, the de-jure market-level financial

[7] Comparing the R square across these regression models, the lower R square in the models with IOBIT, ITG, and ITB as dependent variables, suggests IOBIT, ITG, and ITB have more uncertainty or unknown factors and thus are less predictable than aggregate information timeliness. However, the significant relationship between financial integration and these variables (IOBIT, ITG, and ITB) suggests financial integration, both market- and firm-level are important factors, explaining the imbalanced optimistically biased information timeliness in Emerging Markets.

integration (DJFI) is significantly and positively related to information timeliness (IT) (0.032, $p<0.01$) and deflated information timeliness (ITD) (0.023, $p<0.01$). The de-facto market-level financial integration (DFFI) is significantly and positively related to deflated information timeliness (ITD) (0.011, $p<0.10$) but not significantly related to information timeliness (IT). The results in general suggest a rejection of null hypothesis 1 and indicate that market-level financial integration reduces information timeliness in emerging markets. This is because market-level financial integration delays information timeliness of bad news. This impact dominates over its potential impact in improving information timeliness of good news. Indeed, Table 4 Column 3 shows that DJFI and DFFI are negatively and significantly related to IOBIT (-0.101, $p<0.01$, and -0.028, $p<0.01$ respectively). When we distinguish between information timeliness for different types of information, Table 4 Column 4 and 5 show that DJFI is negatively and significantly related to ITG (-0.08, $p<0.01$), and positively and significantly related to ITB (0.017, $p<0.05$). DFFI is positively and significantly related to both ITG (0.046, $p<0.01$) and ITB (0.077, $p<0.01$). These results support our Hypothesis 2, and suggest that market-level financial integration stimulates global information asymmetry related agency problems and leads to more imbalanced optimistically biased information timeliness. More specifically, DJFI has bigger impacts on increasing IOBIT than DFFI (effect size difference significant level $p<0.01$). This suggests that DJFI, rather than DFFI, is more likely to augment global information asymmetries between large and minority shareholders in emerging markets and affect good and bad information timeliness asymmetrically. Our results are in line with previous literature suggesting that large shareholders have strong incentives to extract private benefits by engaging in imbalanced information disclosure and communication (e.g., Kothari et al., 2009; Ferreira et al., 2011; Zhang et al., 2013, 2017).

Regarding firm-level financial integration, foreign ownership (FFIFO) has no significant effects on either IT or ITD. Cross-listing (FFICL) is significantly and negatively related to IT (-0.018, p<0.01) and ITD (-0.016, p<0.01). Contrary to market-level financial integration, firm-level financial integration improves information timeliness. Thus, the null hypothesis 3 is rejected. These results suggest that firm-level financial integration has different impacts than market-level financial integration and it is the engagement of firm-level financial integration by a firm itself from emerging markets which positively improves the disclosure quality and information timeliness, in line previous research (Bae et al., 2012; Fang et al., 2015).

As Table 4 Column 3 shows, both FFIFO and FFICL are significantly and positively related to IOBIT (0.015, P<0.01 and 0.012, P<0.01 respectively). Our hypothesis 4 is therefore fully supported. When we distinguish between information timeliness for different types of information, we find that FFIFO and FFICL are significantly and positively related to ITG (0.011, p<0.01 and 0.015, p<0.01 respectively). FFIFO and FFICL are significantly and negatively related to ITB (-0.004, p<0.1 and -0.002, p<0.1 respectively). These results suggest that firm-level financial integration mitigates optimistically biased information timeliness. More specifically, firm-level financial integration reduces information timeliness for good news and improves information timeliness for bad news. The evidence suggests that firm-level financial integration mitigates information asymmetries between large and minority shareholders, in line with others (e.g., Baker et al., 2002; Lang et al., 2003; Bae et al., 2012), and corrects the imbalanced optimistically biased information timeliness in emerging markets.

Regarding investor protection standards (IPS), it is significantly and negatively related to IT (-0.154, p<0.01) and ITD (-0.139, p<0.01). Thus we reject our null hypothesis 6, and

accept that investor protection standards improve information timeliness in emerging markets. Moreover, investor protection standards (IPS) is significantly and positively related to IOBIT (0.109, $p<0.01$), which supports our hypothesis 7. When we further investigate information timeliness for different types of information, we find that investor protection standards (IPS) is significantly and negatively related to ITB (-0.085, $p<0.01$). These results suggest that better investor protection mitigates optimistically biased information timeliness mainly by ensuring bad information is communicated with investors in a more timely manner. Consistent with the literature, we find a disciplining effect of legal environment on corporate disclosure (Admati & Pfleiderer, 2000; Leuz et al., 2003; Aslan & Kumar, 2014).

Regarding the control variables, we only discuss the consistent outcome across all the tests. We find that IT and ITD are significantly and positively related to STOCKGDP, COMMON and IFI. The results suggest that stock market development, adopting British common law system, and better information flow have not helped emerging market firms to enhance information timeliness. Moreover, we find that IOBIT is significantly and negatively related to all five country-level control variables including STOCKGDP, COMMON, IFI, CPI and GDPPC. These results highlight the importance in understanding the factors in mitigating the generally imbalanced and optimistically biased information environment in many emerging markets (Dyck & Zingales, 2004; Khurana et al., 2013; Zhang et al., 2013, 2015, 2017; Ang & Ma, 2001). As for the effects of COMMON, it is in contrast with the impacts of investor protection standards (IPS). This suggests that it is the investor protection standard embedded in a law system rather than the simple common law origin that mitigates IOBIT and enhances investor protection outcomes in emerging markets.

Regarding the firm-level control variables, we find that IT and ITD are

significantly and negatively related to SIZE, PROFIT and BM, while significantly and positively related to LEV, VOL and SIE. The results confirm previously documented evidences (e.g., Beekes & Brown, 2006; Beekes et al., 2014, 2016). Large companies have better information timeliness than small ones, confirming other evidences (e.g., Beekes & Brown, 2006; Beekes et al., 2014). Moreover, IOBIT is significantly and negatively related to SIZE and VOL, while significantly and positively related to PROFIT, LEV and BM. These results suggest the complexity of large companies in emerging markets facilitate large shareholder abuse of their forward-looking information advantages over minority shareholders to suppress more bad forward-looking information relative to good. Firm's earnings (PROFIT) improve information timeliness and mitigate IOBIT, which suggests that more profitable firms are more transparent and less likely to engage in imbalanced and optimistically biased information communication with investors. Firms with high debt ratio (LEV) and high return uncertainty (VOL) have decreased information timeliness, but high debt level and return volatility mitigates IOBIT. These results suggest that debt-holders mitigate principal-principal conflicts whilst high uncertainty augments principle-principle conflicts, in line with previous research (Lucey & Zhang; 2011; Zhang et al., 2015). A firm with high book to market ratio (BM) has improved information timeliness and mitigated IOBIT. This suggests mature firms with low growth opportunities are more transparent in their prospects with fewer agency conflicts in extracting private benefits. A firm with a structure of information environment dominated by good information (SIE) reduces information timeliness, suggesting overall investors apply conservatism in incorporating positive information into price over the year, in line with previous research (e.g., LaFond & Watts, 2008; Ramalingegowda & Yu, 2012).

[Insert Table 4 about here]

4.3. Robustness tests

In country-level studies, the primary issue is that countries may time their market opening decisions to correspond with windows of opportunity when overall market-level information timeliness is likely to improve anyway. Because we focus on firm-level information timeliness, with firm-level financial integration varying within countries, endogeneity that arises from countries timing the market-level financial integration decision is not a major concern. However, at the firm level it is possible that firms with some characteristics choose to engage in firm-level financial integration only when firms are ready to do so. Thus, some reverse causality could exist, in which case the impact of firm-level financial integration on information timeliness could be overstated.

To address the endogeneity issue, we use mixed effects models. Traditional fixed effect panel regression models prevent us from including time-invariant variables which are common in our analysis. Mixed effects models, by effectively controlling for average firm-level characteristics, can address the endogeneity concerns arising from time-invariant firm characteristics (McCulloch et al., 2008; Rabe-Hesketh & Skrondal, 2012)[8], i.e. it is only possible certain types of firms to engage with firm-level financial integration. Because we also have firm-level control variables in our mixed effects models, these firm-level control variables can address the endogeneity concerns arising from time-varying characteristics, i.e. the concern that firms choose to engage in firm-level financial integration only when they reach a stage of development that would be conducive to information timeliness improvements. Table 5 shows the results from the mixed effect model estimations. Our previous conclusions are unchanged.

[Insert Table 5 about here]

[8]We also use random effect panel regressions by adding country, industry and firm dummies. The results remain stable and robust.

Our sample covers the 2007-2008 global financial crisis period, which represents an exogenous event for us to investigate the relationship between financial integration and information timeliness. We therefore split our sample into normal period and Global Financial Crisis (GFC) period and retest our results[9]. Table 6 Panel A reports the results for normal period and Panel B reports the results for GFC period. For simplicity and focus, we only report the results related to our market-level, firm-level financial integration and investor protection variables. Table 6 Column 3 shows, DJFI is significantly and negatively related to IOBIT in normal period while DFFI is significantly and negatively related to IOBIT in GFC period. As table 6 Colum 1 and 2 show, DJFI is significantly and positively related to IT or ITD during normal period, but negatively related to ITD during GFC period. DFFI is insignificantly related to IT or ITD during normal period, but significantly and negatively related to IT or ITD during GFC period. Such change is largely due to the good forward-looking information timeliness during GFC can be communicated with investors in a timelier manner, as Table 6 Panel B Column 4 shows.

Both FFICL and FFIFO is significantly and positively related to IOBIT in normal period and in GFC period, with a significantly bigger effect (effect size difference significant level $p<0.01$) in GFC period than in normal period.

Investor protection is significantly and negatively related to the information timeliness for bad news (ITB) without affecting the information timeliness for good news (ITG) in normal period, but significantly and negatively related to both ITB and ITG in GFC period. These further investigation reveals that, compared their impacts on normal

[9] Our sample also covers frontier markets, a subset of emerging markets, which may have different market level financial integration from other emerging markets (Berger et al, 2011). We therefore split our sample into frontier markets and other emerging markets. Our main results hold robust in non-frontier emerging markets only, suggesting frontier markets indeed, have different financial integration behavior from other emerging markets and our main conclusions do not hold in these sub-set frontier emerging markets.

period, the impacts of investor protection policies during financial crisis periods on correcting IBIOT are particularly driven by its more cautionary stance on good forward-looking information communications with investors.

These results taken together, suggest the GFC, as the exogenous shock to firms in emerging markets, augments large shareholders' incentives to abuse their global information advantages from market-level financial integration, leading to more imbalanced and optimistically biased information timeliness. Thus firm-level financial integration and investor protection, as the mechanisms to mitigate agency problems, become more important to correct IOBIT, in line with our previous findings.

[Insert Table 6 about here]

We use propensity score matching approach to address the issue of reverse causality caused by endogeneity between firm-level financial integration and firm-level information timeliness[10]. We create a Propensity Score Matched (PSM) sample by matching treated firms with those control firms based on nearest neighbour according to DJFI DFFI IPS STOCKGDP COMMON CPI GDPPC IFI SIZE PROFIT LEV BM VOL SIE and Industry. The additional robustness test results using the PSM sample are provided in Table 7. Our results remain stable and robust.

4.4. Interaction tests

In line with Mitton (2006) and Bekaert et al. (2005), another approach to check

[10] Previous research commonly uses difference-in-differences (DID) test to address the reverse causality related endogeneity issue. However, DID needs a clear treatment group, a control group, and a treatment event to distinguish between pre-treatment period and post-treatment period. In our research, the treatment group is firms with foreign investors or cross-listing status. Given firm-level financial integration by having a foreign investor or cross-listing is a gradual, dynamic and reversible process, there is no single event to identify when a firm formally engages in firm-level financial integration. Without reliably identifying pre-treatment periods for those treated firms with foreign investors or cross-listing status, it is not practical for us to use DID to address the issue of reverse causality caused by endogeneity.

causality is to employ firm-level information timeliness variation in the response to firm-level financial integration under different exogenous conditions (such as market-level financial integration and investor protection standards in our study). Thus, if firm-level financial integration has a causal effect on information timeliness, then it should have a weaker impact on IT and ITD of firms that are subject to more severe principal-principal conflicts and/or have a reduced demand on foreign investors to mitigate principal-principal conflicts. If, on the other hand, the causality runs in the other direction, then this cross-sectional pattern would not be predicted[11]. The above interaction effects are generalized as hypothesis 5 and hypothesis 8.

Table 8 reports the interaction effects of firm-level financial integration (FFICL and FFIFO) with market-level financial integration (DJFI and DFFI) and with investor protection standard (IPS). In the tests, we include all main effects, and add the interaction term between firm-level financial integration and one of these market-level conditional variables (i.e., one of DJFI, DFFI and IPS). For simplicity and focus, we only report the results related to the interaction effects and the marginal effects of firm-level financial integration (FFICL and FFIFO) when DJFI, DFFI or IPS is at a low or high level. Following Brambor et al. (2006), we categorise the low (high) level of DJFI, DFFI or IPS when it is below (above) the average level in the sample.

As Table 8 Panel A Column 3 shows, DJFI significantly and negatively interacts with both FFICL and FFIFO in affecting IOBIT. The marginal effects of FFICL are positive and significant at both low level (0.132, $p<0.01$) and high level (0.047, $p<0.1$) of DJFI. The marginal effects of FFIFO are positive and significant at both low level (0.059, $p<0.01$) and high level (0.028, $p<0.01$). These results suggest that both FFICL

[11] As our additional robust check, we also use lagged variables as instrumental variables and run AB-GMM estimations. Results remain stable and robust.

and FFIFO have weaker impacts in mitigating IOBIT for firms in emerging markets when DJFI increases. Particularly, the interaction between DJFI and FFIFO is significantly negative, simultaneously in both information timeliness for good and bad news, as shown in Table 8 Panel A Column 4 and 5. This leads to weakened impacts of FFIFO in improving information timeliness, as shown in Table 8 Panel A Column 1 and 2. DFFI does not have such moderation effects on firm-level financial integration in affecting information timeliness, suggesting that de-facto market-level financial integration is less likely than de-jure market-level financial integration to be abused by large shareholders in augmenting global information asymmetries and weakening the monitoring benefits of firm-level financial integration. Taken together, our hypothesis 5 is supported.

Table 8 Panel B shows that FFIFO significantly and negatively interacts with IPS in affecting IOBIT. Particularly, the marginal effects of FFIFO are positive and significant at both low level (0.056, $p<0.01$) and high level (0.033, $p<0.01$) of IPS. This suggests that FFIFO has smaller impacts in mitigating IOBIT for firms from where investor protection standards are stronger. The interaction between IPS and FFIFO is significantly negative, simultaneously in both information timeliness for good and bad news, as shown in Table 8 Panel B Column 4 and 5. This leads to weakened impacts of FFIFO in improving information timeliness, as shown in Table 8 Panel B Column 1 and 2. IPS does not have such moderation effects on FFICL, suggesting that IPS is more likely to mitigate the global information advantages of foreign investors if the firm is not cross-listed in advanced markets and weaken the monitoring benefits of foreign investors in emerging markets. Taken together, our hypothesis 8 is supported. Overall, our evidence suggests that there are causal effects associated with firm-level financial integration on information timeliness and imbalanced optimistically biased information

timeliness.

[Insert Table 8 about here]

5. Discussions and conclusions

Balanced information timeliness by informing investors about the firm prospectus, is crucial for stock market efficiency and investor protection (Feldman et al., 2010; Merkley, 2014). Emerging markets have different institutional environments to advanced markets so that information timeliness in many emerging markets can be imbalanced and biased towards good relative to bad. We examine the effects of financial integration and investor protection on information timeliness using 24 emerging markets during the period 1996-2016. We find that financial integration and investor protection quality do not necessarily affect aggregate information timeliness. But market-level financial integration augments IOBIT while firm-level financial integration and investor protection mitigate IOBIT. The effects of firm-level financial integration in mitigating IOBIT is mitigated when market-level financial integration increases and/or investor protection becomes stronger.

Our results suggest agency conflicts may be the reasons that market-level financial integration does not necessarily lead to firm-level financial integration, in line with previous literature (Harvey, 1995; Kang & Stulz, 1997; Mitton, 2006; Claessens & Schmuckler, 2007; Li et al., 2015). By revealing the costs of market-level financial integration and benefits of firm-level financial integration in affecting information timeliness and IOBIT, our analysis has implications for regulators who aim to enhance benefits of financial integration and mitigate its costs.

Regarding the debate on optimal bundle of governance mechanisms in mitigating agency costs (Aslan & Kumar, 2014), our research suggests that a firm which chooses to

respond to market-level openness by actively engaging with their own firm-level financial integration can signal their corporate governance quality to investors, enhancing the benefits associated with firm-level financial integration and reducing the agency costs associated with market-level financial openness. During the financial crisis period, such active engagement in firm-level financial integration is particularly important for investors to delink their firms' information environment from others', in line with Lee et al., (2016). However, it is not enough to exclusively rely on the arms-length monitoring of foreign investors, especially when the increasing market-level integration makes such monitoring service more costly. Our analysis also suggests that investor protection quality is important, especially in a financial crisis period, to set the right incentives for large shareholders in communicating information with investors, addressing the roots of agency problems and assuring investor confidence. By levelling the field for both domestic and foreign investors, investor protection standards gradually reduces the demand on the monitoring service offered by foreign investors in mitigating global information asymmetries.

We focus on market-level and firm-level financial integration. Further research could also explore channels through which financial integration might affect the information timeliness in emerging markets. For example, has financial integration increased disclosure levels in terms of both the frequency and the amount of disclosure? Has financial integration increased the trading intensity from informed investors? These questions are important for us to understand the mechanisms via which financial integration can affect managerial disclosure decisions, information content of share price and price discovery efficiency in emerging markets.

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Table 1. Variable definitions

Variable	Description	Source
Panel A: Timeliness variables		
IT (Information Timeliness)	Information timeliness, estimated as in Eq.(1).	Datastream &Worldscope
ITD (Information Timeliness Deflated)	Information timeliness deflated. This measure is calculated by deflating the raw timeliness measure in Eq.(1) by one plus the absolute rate of return on the share over the period	Datastream & Worldscope
IOBIT (Imbalanced Optimistically Biased Information Timeliness)	Imbalanced, optimistically biased information timeliness, measured with the ratio of ITG divided by ITB.	Datastream &Worldscope
ITG (Information Timeliness for Good News)	Information timeliness of good news, estimated as in Eq.(2).	Datastream &Worldscope
ITB (Information Timeliness for Bad News)	Information timeliness of bad news, estimated as in Eq.(2).	Datastream &Worldscope
Panel B: Financial integration variables		
DJFI (De-jury Financial Integration)	A country-level de-jure measure of openness in capital controls based on information from the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER).	Chinn and Ito (2006)
DFFI (De-facto Financial Integration)	A country-level de-facto measure of financial integration gauging the interdependency between country and world equity index returns, with time-varying and regime-switching characteristics.	Federal Reserve Economic Data & Thomson Reuters Eikon
FFIFO (Firm-level Financial Integration via Foreign Ownership)	A firm-level measure of the proportion of outstanding shares held by foreign investors.	Thomson Reuters Eikon
FFICL (Firm-level Financial Integration via Cross-Listing)	A firm-level dummy variable that is equal to one if the firm is cross-listed on a foreign exchange in that year and zero otherwise.	Bank of New York Mellon
Panel C: Investor protection standards		
IPS (Investor Protection Standard)	Investor protection standards measurement, by singling out three indicators of national governance quality out of the six dimensional World Governance Indicators (WGIs), namely government effectiveness, regulatory quality, and the rule of law. IPS = Government Effectiveness + Regulatory Quality + Rule of Law.	World Governance Indicators (WGIs)(World Bank, 2013)
Panel D: Country-level control variables		
STOCKGDP (Stocks to GDP)	The ratio of the total value of stocks traded on official stock exchanges in a country to that country's GDP.	World Development Indicators (World Bank, 2013)
IFI (Information Flow Index)	Measured using data such as internet users (per 1,000 people), television (per 1,000 people), and trade in newspapers (percentage of GDP).	KOF Index of Globalization (Dreher, 2006)
CPI (Consumer Price Index)	The annual percentage change in the consumer price index	World Development Indicators (World Bank, 2013)
GDPPC (GDP Per Capita)	The natural logarithm of GDP per capita in constant 2005 US dollars.	World Development Indicators (World Bank,2013)
COMMON	A dummy variable that is equal to one if the country adopts the British common	La Porta et al. (1998)

	law system and zero otherwise.	
Panel E: Firm-level control variables		
SIZE (Firm Size of Market Capitalization)	The natural logarithm of market capitalization of a firm in US dollars (Worldscopeitem07210).	Worldscope
PROFIT (Profitability)	Earnings before interest, taxes and depreciation (Worldscope item 18198) divided by total assets (Worldscope item02999).	Worldscope
LEV (Leverage)	Total debt (Worldscope item 03255) divided by total assets.	Worldscope
BM (Book to Market Ratio)	Total shareholder's equity (Worldscope item 03995) divided by market capitalization (Worldscope item 08001).	Worldscope
VOL (Volatility)	The standard deviation of daily stock returns over the 360 days	Datastream
SIE (Structure of Information Environment)	A dummy variable captures the structure of information environment for a firm. SIE is equal to one if the firm outperforms the local market over the timeliness estimation period, and zero otherwise.	Datastream

Table 2. Summary statistics

VARIABLES	(1) N	(2) Mean	(3) Median	(4) SD	(5) Min	(6) Max
IT	110,583	0.219	0.219	0.166	0.0361	0.933
ITD	110,583	0.152	0.152	0.0827	0.0340	0.430
IOBIT	110,583	1.013	1.013	0.158	0.634	1.531
ITG	110,583	0.496	0.496	0.0883	0.263	0.721
ITB	110,583	0.494	0.494	0.0823	0.279	0.714
DJFI	110,583	-0.291	-0.291	1.121	-1.202	2.360
DFFI	110,583	0.753	0.753	0.219	0.225	1.142
FFICL	110,583	0.0331	0.0331	0.179	0	1
FFIFO	110,583	0.0895	0.0895	0.170	0	0.519
IPS	110,583	0.709	0.031	1.616	-2.151	4.194
STOCKGDP	110,583	0.741	0.741	0.660	0.0156	3.554
IFI	110,583	70.41	70.41	12.01	48.69	89.81
CPI	110,583	0.0467	0.0467	0.0404	-0.0118	0.232
GDPPC	110,583	9.417	9.417	0.673	7.931	10.46
COMMON	110,583	0.390	0.390	0.488	0	1
SIZE	110,583	25.43	25.43	2.026	20.90	30.10
PROFIT	110,583	0.0319	0.0319	0.0938	-0.404	0.288
LEV	110,583	0.240	0.240	0.190	0	0.724
BM	110,583	1.063	1.063	1.109	0.0506	6.549
VOL	110,583	0.0265	0.0265	0.0118	0.00686	0.0734
SIE	110,583	0.465	0.465	0.499	0	1

Note: See Table 1 for definitions of the variables.

Table 3. Correlation matrix (N=110,583)

	IT	ITD	IOBIT	ITG	ITB	DJFI	DFFI	FFICL	FFIFO	IPS	STOCKGDP	IFI	CPI	GDPPC	COMMON	SIZE	PROFIT	LEV	BM	VOL	SIE
IT	1.00																				
ITD	0.93	1.00																			
IOBIT	0.00	0.01	1.00																		
ITG	0.16	0.18	0.47	1.00																	
ITB	0.19	0.20	-0.39	0.60	1.00																
DJFI	0.00	-0.01	-0.01	-0.02	-0.01	1.00															
DFFI	-0.01	0.00	0.03	0.01	-0.02	-0.24	1.00														
FFICL	-0.06	-0.07	0.01	0.01	-0.01	0.01	0.02	1.00													
FFIFO	-0.02	-0.03	0.01	0.01	-0.02	0.09	-0.09	0.15	1.00												
IPS	0.02	0.01	0.01	0.01	-0.02	0.39	-0.24	-0.05	-0.01	1.00											
STOCKGDP	0.00	0.02	-0.05	-0.14	-0.11	-0.15	0.32	-0.09	-0.18	0.13	1.00										
IFI	0.00	-0.02	0.00	0.00	0.00	0.47	0.06	0.00	0.01	0.69	0.14	1.00									
CPI	0.04	0.04	0.02	0.02	0.02	-0.10	0.07	0.08	0.14	-0.37	-0.32	-0.34	1.00								
GDPPC	-0.04	-0.04	-0.01	-0.01	-0.01	0.59	0.03	-0.01	-0.02	0.58	0.22	0.68	-0.32	1.00							
COMMON	0.05	0.04	-0.04	0.03	0.07	-0.24	-0.51	0.01	0.05	-0.04	-0.26	-0.37	0.09	-0.37	1.00						
SIZE	-0.22	-0.22	-0.06	-0.08	-0.03	-0.11	0.29	0.25	0.16	-0.17	0.26	-0.06	-0.09	0.04	-0.31	1.00					
PROFIT	-0.21	-0.20	-0.02	-0.05	-0.03	-0.08	0.01	0.05	0.11	-0.14	-0.05	-0.14	0.09	-0.14	0.06	0.28	1.00				
LEV	0.08	0.08	0.02	0.04	0.02	-0.03	0.01	0.02	-0.05	-0.05	-0.02	-0.07	0.02	-0.08	0.05	-0.03	-0.28	1.00			
BM	0.10	0.09	0.10	0.11	0.02	0.09	-0.16	-0.03	-0.02	0.10	-0.18	0.08	0.05	0.02	0.13	-0.49	-0.16	0.07	1.00		
VOL	0.34	0.34	-0.01	-0.04	-0.05	-0.06	0.04	-0.09	-0.10	0.01	0.13	-0.02	0.05	-0.03	0.03	-0.32	-0.26	0.09	0.13	1.00	
SIE	0.01	0.03	-0.01	-0.01	0.00	-0.01	0.02	0.00	0.00	-0.02	0.06	0.00	-0.05	0.01	-0.03	0.13	0.19	-0.07	-0.15	-0.06	1.00

Note: this table reports the Pearson correlations between the timeliness and explanatory variables. See Table 1 for definitions of the variables. All time varying variables are winsorized at the 1% and 99% percentiles. Correlations bigger than 0.01 are significant at 1% level.

Table 4. The impacts of financial integration and investor protections on information timeliness

	(1) IT	(2) ITD	(3) IOBIT	(4) ITG	(5) ITB
DJFI	0.032***	0.023***	-0.101***	-0.080***	0.017**
	(4.364)	(3.086)	(-12.826)	(-10.174)	(2.101)
DFFI	0.001	0.011*	-0.028***	0.046***	0.077***
	(0.080)	(1.837)	(-4.089)	(7.489)	(11.870)
FFIFO	0.001	0.002	0.015***	0.011***	-0.004*
	(0.344)	(0.573)	(4.610)	(3.447)	(-1.705)
FFICL	-0.018***	-0.016***	0.012***	0.015***	-0.002*
	(-5.615)	(-5.045)	(4.066)	(5.907)	(-1.709)
IPS	-0.154***	-0.139***	0.109***	0.013	-0.085***
	(-7.865)	(-7.342)	(5.354)	(0.713)	(-4.310)
STOCKGDP	0.026***	0.041***	-0.038***	-0.183***	-0.165***
	(5.480)	(8.643)	(-7.310)	(-33.220)	(-29.071)
COMMON	0.112***	0.056*	-0.477***	-0.109***	0.324***
	(3.653)	(1.771)	(-14.089)	(-3.490)	(10.332)
IFI	0.090***	0.051***	-0.128***	-0.063***	0.065***
	(5.050)	(2.923)	(-7.200)	(-3.731)	(3.788)
GDPPC	0.028	0.019	-0.301***	-0.032	0.219***
	(1.313)	(0.858)	(-13.019)	(-1.508)	(10.135)
CPI	0.006	0.008*	-0.020***	-0.037***	-0.020***
	(1.389)	(1.738)	(-3.891)	(-7.528)	(-4.137)
SIZE	-0.066***	-0.091***	-0.064***	-0.040***	0.016***
	(-12.591)	(-17.714)	(-12.759)	(-8.572)	(3.508)
PROFIT	-0.135***	-0.120***	0.008**	-0.037***	-0.045***
	(-28.677)	(-29.519)	(2.240)	(-10.449)	(-12.455)
LEV	0.016***	0.022***	0.016***	0.019***	0.006**
	(4.501)	(6.353)	(4.973)	(6.404)	(1.994)
BM	-0.019***	-0.021***	0.097***	0.088***	-0.003
	(-4.071)	(-4.884)	(24.265)	(22.963)	(-0.836)
VOL	0.279***	0.269***	-0.047***	-0.072***	-0.039***
	(60.122)	(65.163)	(-11.955)	(-17.789)	(-9.350)
SIE	0.067***	0.077***	0.004	---	---
	(24.215)	(26.704)	(1.311)		
N	110,583	110,583	110,583	110,583	110,583
Adj. R^2	0.220	0.221	0.107	0.142	0.114
F	194.976	248.968	96.502	167.856	119.797
Country effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes

Note: * $p<0.1$; ** $p<0.05$; *** $p<0.01$. See Table 1 for definitions of the variables. For the regression model, please refer back to Equation 8 in our main text for details. The time invariant variables prevent us from controlling firm fixed effect directly, which is indirectly controlled by using standard errors clustered at a firm level. t statistics are reported in parentheses. All time varying variables are winsorized at the 1% and 99% percentiles. Coefficients are standardised.

Table 5. The impacts of financial integration and investor protections on information timeliness (Mixed effect models)

	(1) IT	(2) ITD	(3) IOBIT	(4) ITG	(5) ITB
DJFI	0.034***	0.023***	-0.098***	-0.081***	0.012
	(4.979)	(3.394)	(-12.861)	(-10.980)	(1.622)
DFFI	0.001	0.007*	-0.022***	0.049***	0.073***
	(1.193)	(1.670)	(-3.636)	(8.198)	(11.950)
FFIFO	-0.001	0.000	0.014***	0.009***	-0.004*
	(-0.179)	(0.114)	(4.293)	(2.802)	(-1.779)
FFICL	-0.016***	-0.015***	0.013***	0.015***	-0.002*
	(-4.419)	(-4.261)	(3.983)	(4.892)	(1.635)
IPS	-0.125***	-0.112***	0.114***	0.023	-0.088***
	(-8.282)	(-7.351)	(6.087)	(1.324)	(-4.818)
STOCKGDP	0.029***	0.043***	-0.040***	-0.184***	-0.161***
	(5.840)	(8.755)	(-7.287)	(-34.785)	(-29.530)
COMMON	0.050**	0.022	-0.144**	0.039	0.159***
	(2.279)	(0.983)	(-2.056)	(1.113)	(3.164)
IFI	0.090***	0.050***	-0.113***	-0.057***	0.055***
	(5.781)	(3.216)	(-6.453)	(-3.407)	(3.189)
GDPPC	-0.018	-0.012	-0.269***	-0.014	0.187***
	(-0.993)	(-0.657)	(-11.959)	(-0.680)	(8.540)
CPI	0.007	0.008*	-0.020***	-0.037***	-0.021***
	(1.513)	(1.893)	(-4.096)	(-7.799)	(-4.345)
SIZE	-0.071***	-0.099***	-0.066***	-0.041***	0.015***
	(-14.120)	(-19.913)	(-13.954)	(-8.905)	(3.294)
PROFIT	-0.128***	-0.113***	0.009***	-0.036***	-0.045***
	(-38.185)	(-33.657)	(2.600)	(-10.740)	(-13.235)
LEV	0.023***	0.029***	0.020***	0.023***	0.005
	(6.848)	(8.677)	(6.178)	(7.082)	(1.432)
BM	-0.014***	-0.016***	0.105***	0.094***	-0.004
	(-3.723)	(-4.398)	(28.777)	(26.586)	(-1.060)
VOL	0.257***	0.247***	-0.048***	-0.074***	-0.039***
	(74.421)	(71.898)	(-13.351)	(-21.099)	(-10.943)
SIE	0.072***	0.082***	0.005*	---	---
	(25.438)	(29.110)	(1.649)		
N	110,583	110,583	110,583	110,583	110,583
Chi2	11,905.879	11,840.892	2,376.153	3,821.260	1,474.759
Country effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes
Firm effect	Yes	Yes	Yes	Yes	Yes

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. See Table 1 for definitions of the variables. For the regression model, please refer back to Equation 8 in our main text for details. Mixed effects combine fixed effect and random effects from year, country, industry and firm levels. z statistics are reported in parentheses. All time varying variables are winsorized at the 1% and 99% percentiles. Coefficients are standardised.

Table 6. The impacts of financial integration and investor protections on information timeliness (Normal vs Global Financial Crisis Period)

Panel A Normal	(1) IT	(2) ITD	(3) IOBIT	(4) ITG	(5) ITB
DJFI	0.029***	0.022***	-0.030***	-0.044***	-0.010
	(3.563)	(2.629)	(-3.330)	(-5.088)	(-1.096)
DFFI	0.006	-0.000	0.003	0.074***	0.078***
	(0.898)	(-0.051)	(0.357)	(10.936)	(10.938)
FFIFO	-0.002	-0.001	0.014***	0.007**	-0.006**
	(-0.589)	(-0.245)	(3.893)	(2.158)	(-1.992)
FFICL	-0.014***	-0.013***	0.007**	0.014***	-0.006**
	(-4.165)	(-3.701)	(2.142)	(5.190)	(-2.189)
IPS	-0.138***	-0.129***	0.034*	0.044	-0.065***
	(-6.263)	(-6.072)	(1.661)	(1.056)	(-2.875)
N	96922	96922	96922	96922	96922
Adj. R2	0.167	0.169	0.109	0.124	0.098
Panel B GFC	(1)	(2)	(3)	(4)	(5)
DJFI	-0.058	-0.132***	-0.074	-0.142**	-0.103*
	(-1.229)	(-2.732)	(-1.404)	(-2.449)	(-1.791)
DFFI	-0.236***	-0.272***	-0.523***	-0.166**	0.331***
	(-4.887)	(-5.312)	(-8.148)	(-2.523)	(4.657)
FFIFO	0.020**	0.017*	0.017**	0.018**	0.005
	(2.231)	(1.886)	(2.024)	(2.024)	(0.581)
FFICL	-0.042***	-0.038***	0.027***	0.018***	-0.010
	(-6.145)	(-5.264)	(4.168)	(2.650)	(-1.429)
IPS	0.496***	0.596***	1.160***	0.260*	-0.804***
	(3.808)	(4.607)	(8.996)	(1.817)	(-5.883)
N	13,661	13,661	13,661	13,661	13,661
Adj. R2	0.191	0.178	0.269	0.146	0.155

Note: * $p<0.1$; ** $p<0.05$; *** $p<0.01$. See Table 1 for definitions of the variables. For the regression model, please refer back to Equation 8 in our main text for details. GFC is the period 2007-2008. Time invariant variables prevent us from controlling firm fixed effect directly, which is indirectly controlled by using standard errors clustered at a firm level. t statistics are reported in parentheses. All time varying variables are winsorized at the 1% and 99% percentiles. Coefficients are standardised. For simplicity and focus, we only report the results related to our market-level, firm-level financial integration and investor protection variables.

Table 7. The impacts of financial integration on information timeliness (Propensity Score Matched Sample Approach)

	(1) IT	(2) ITD	(3) IOBIT	(4) ITG	(5) ITB
DJFI	0.057***	0.065***	-0.133***	-0.106***	0.026
	(3.428)	(3.920)	(-6.743)	(-5.521)	(1.331)
DFFI	0.006	-0.000	-0.012	0.060***	0.084***
	(0.488)	(-0.037)	(-0.823)	(4.140)	(6.054)
FFIFO	0.001	0.002	0.023***	0.019***	-0.001
	(0.181)	(0.393)	(3.471)	(3.073)	(-0.159)
FFICL	-0.021***	-0.019***	0.017***	0.011**	-0.007
	(-4.546)	(-4.075)	(3.122)	(1.987)	(-1.300)
IPS	-0.176***	-0.168***	0.076*	-0.001	-0.094**
	(-4.658)	(-4.570)	(1.835)	(-0.026)	(-2.272)
N	21,586	21,586	21,586	21,586	21,586
Adj. R^2	0.171	0.171	0.089	0.112	0.094

Note: * $p<0.1$; ** $p<0.05$; *** $p<0.01$. See Table 1 for definitions of the variables. For the regression model, please refer back to Equation 8 in our main text for details. We create a Propensity Score Matched (PSM) sample by matching treated firms with those control firms based on nearest neighbour according to DJFI DFFI IPS STOCKGDP COMMON CPI GDPPC IFI SIZE PROFIT LEV BM VOL SIE and Industry. The time invariant variables prevent us to control firm fixed effect directly, which is indirectly controlled by using standard errors clustered at a firm level. t statistics are reported in parentheses. All time varying variables are winsorized at the 1% and 99% percentiles. Coefficients are standardised. For simplicity and focus, we do not report the results related to those control variable and only report the results related to our market-level, firm-level financial integration and investor protection variables.

Table 8. Interaction effects of firm-level financial integration with market level financial integration and investor protection on information timeliness

Panel A	IT (1)	ITD (2)	IOBIT (3)	ITG (4)	ITB (5)
DJFI*FFICL	-0.025	-0.040	-0.085***	-0.023	-0.033
	(-0.63)	(-1.05)	(-2.38)	(-0.65)	(-0.96)
Marginal	-0.055*	-0.046	0.132***	0.106***	0.020
Effect (L)	(-1.74)	(-1.51)	(4.76)	(4.09)	(0.83)
Marginal	-0.080***	-0.085***	0.047*	0.083***	-0.012
Effect (H)	(-2.81)	(-3.14)	(1.84)	(3.05)	(-0.47)
DJFI*FFIFO	0.025**	0.032***	-0.031**	-0.065***	-0.045***
	(1.96)	(2.58)	(2.49)	(-5.17)	(-3.65)
Marginal	-0.045***	-0.047***	0.059***	0.040***	-0.012
Effect (L)	(-4.61)	(-4.99)	(6.35)	(4.29)	(-1.34)
Marginal	-0.019**	-0.015*	0.028***	-0.025***	-0.057***
Effect (H)	(-1.96)	(-1.65)	(2.93)	(-2.57)	(-6.08)
DFFI*FFICL	-0.029	-0.031	0.023	-0.023	-0.033
	(-0.82)	(-0.88)	(0.65)	(-0.65)	(-0.96)
Marginal	-0.056**	-0.054**	0.074***	0.106***	0.020
Effect (L)	(-1.98)	(-1.99)	(2.93)	(4.09)	(0.83)
Marginal	-0.085***	-0.084***	0.097***	0.083***	-0.012
Effect (H)	(-2.85)	(-2.96)	(3.61)	(3.05)	(-0.47)
DFFI*FFIFO	-0.077***	-0.075***	0.009	0.022*	0.020
	(-6.28)	(-6.17)	(0.76)	(1.80)	(1.63)
Marginal	0.007	0.007	0.040***	-0.001	-0.043***
Effect (L)	(0.76)	(0.70)	(4.25)	(-0.13)	(-4.70)
Marginal	-0.070***	-0.068***	0.049***	0.021**	-0.024**
Effect (H)	(-7.33)	(-7.30)	(5.26)	(2.22)	(-2.55)
Panel B	(1)	(2)	(3)	(4)	(5)
IPS*FFICL	0.060	0.053	-0.003	-0.016	-0.028
	(1.53)	(1.40)	(-0.08)	(-0.42)	(-0.80)
Marginal	-0.099***	-0.093***	0.089***	0.103***	0.016
Effect (L)	(-3.35)	(-3.36)	(3.50)	(3.96)	(0.66)
Marginal	-0.039	-0.041	0.086***	0.088***	-0.012
Effect (H)	(-1.26)	(-1.38)	(3.13)	(3.13)	(-0.43)
IPS*FFIFO	0.049***	0.044***	-0.024*	-0.055***	-0.037***
	(3.63)	3.42	(-1.88)	(-4.36)	(-2.97)
Marginal	-0.057***	-0.053***	0.056***	0.037***	-0.015*
Effect (L)	(-5.66)	(-5.54)	(5.96)	(3.93)	(-1.65)
Marginal	-0.008	-0.009	0.033***	-0.018*	-0.052***
Effect (H)	(-0.79)	(-0.95)	(3.45)	(-1.88)	(-5.57)
N	110,583	110,583	110,583	110,583	110,583

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. See Table 1 for definitions of the variables. For the main effect regression model, please refer back to Equation 8 in our main text for details. In the interaction tests, we include all main effects, and add the interaction term between firm-level financial integration and one of these market-level conditional variables (i.e., one of DJFI, DFFI and IPS). For simplicity and focus, we only report the results related to the interaction effects and the marginal effects of firm-level financial integration (FFICL and FFIFO) when DJFI, DFFI or IPS is at a low or high level. Following Brambor et al. (2006), we categorise the low (high) level of DJFI, DFFI or IPS when it is below (above) the average level in the sample. The time invariant variables prevent us from controlling firm fixed effect directly, which is indirectly controlled by using standard errors clustered at a firm level. t statistics are reported in parentheses. All time varying variables are winsorized at the 1% and 99% percentiles. Coefficients are standardised.

Figure 1

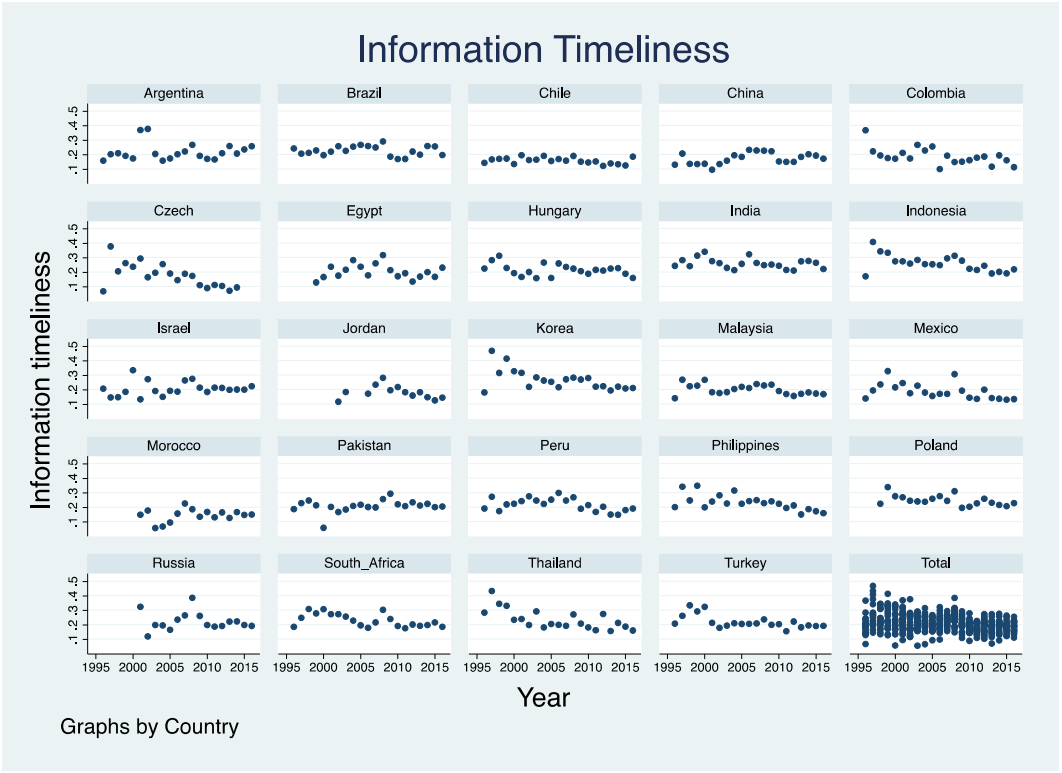

Figure 2

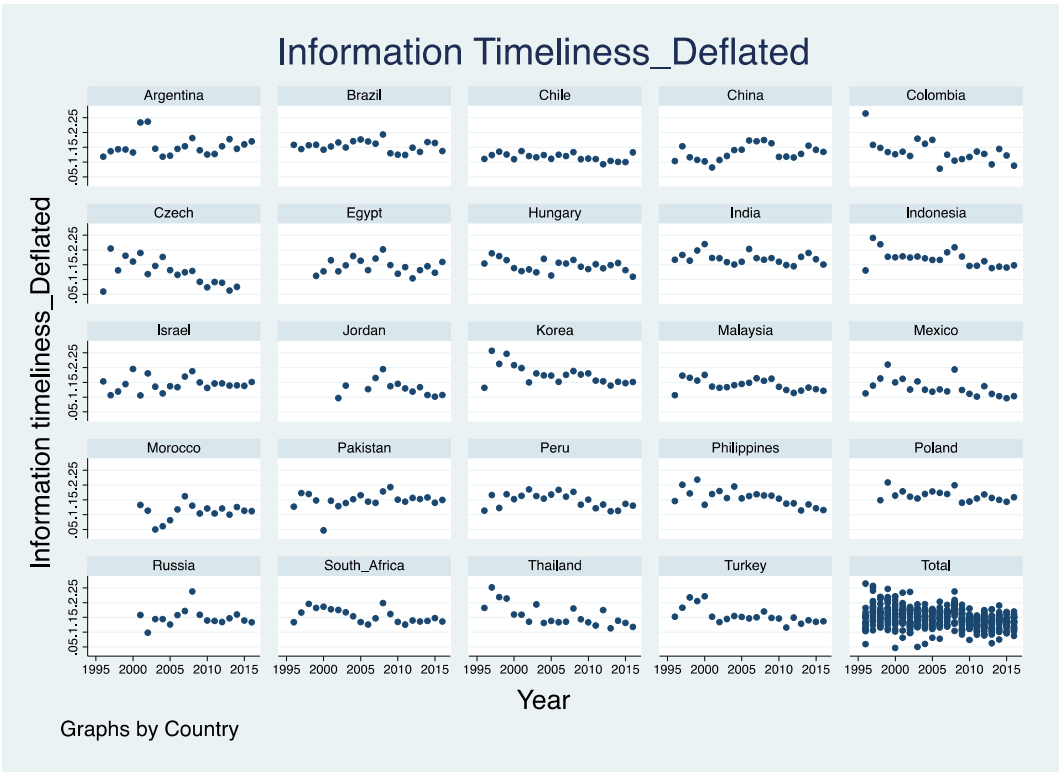

Figure 3

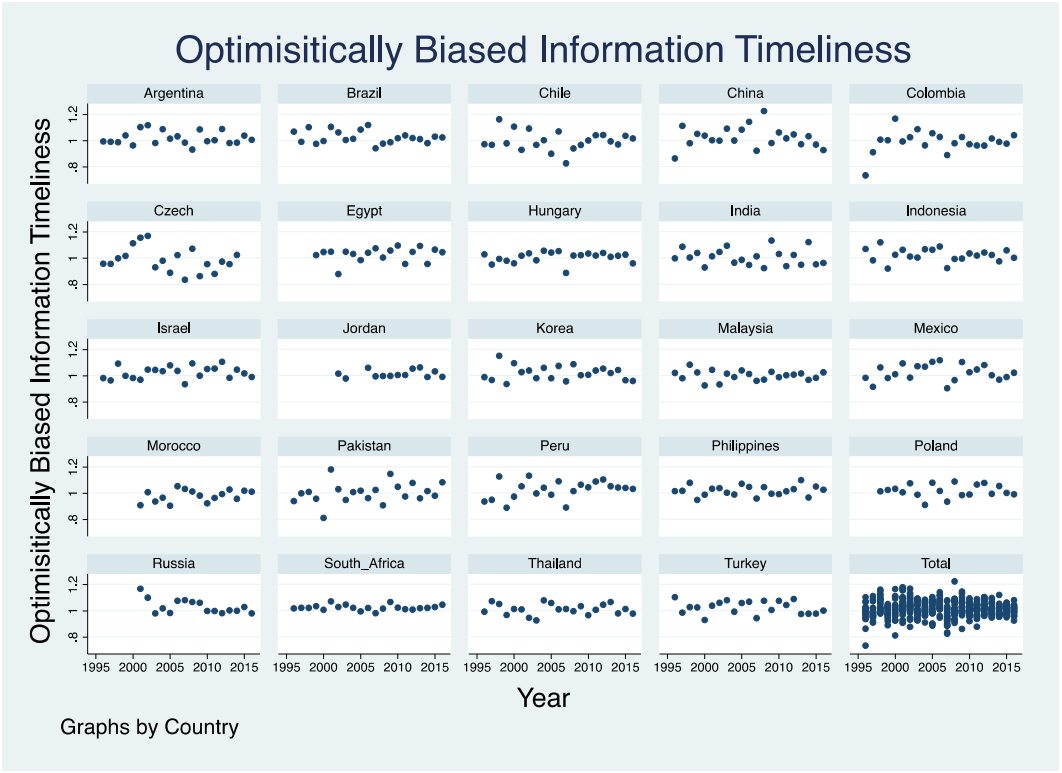

Figure 4

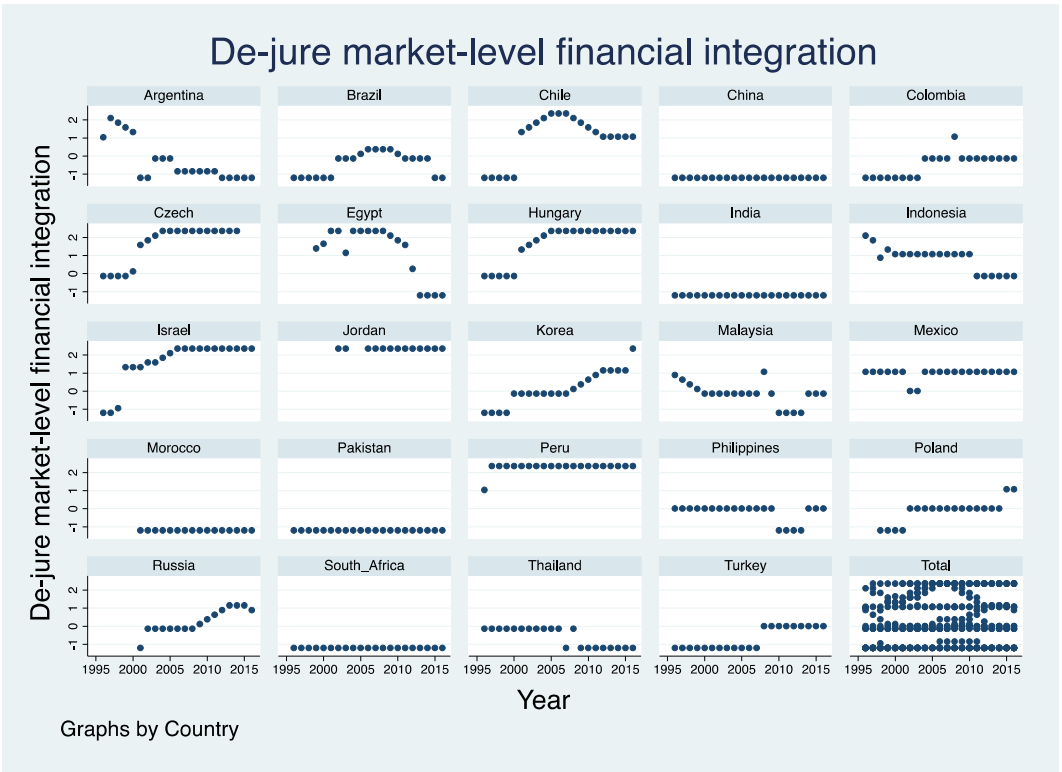

Figure 5

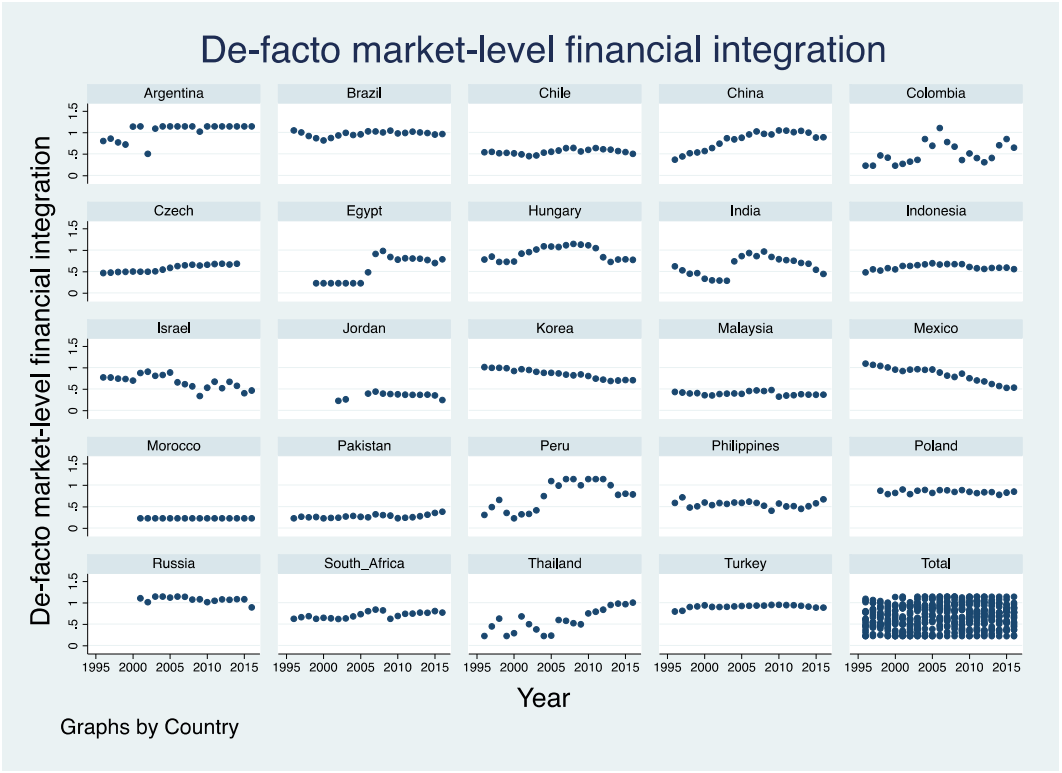

Figure 5_A

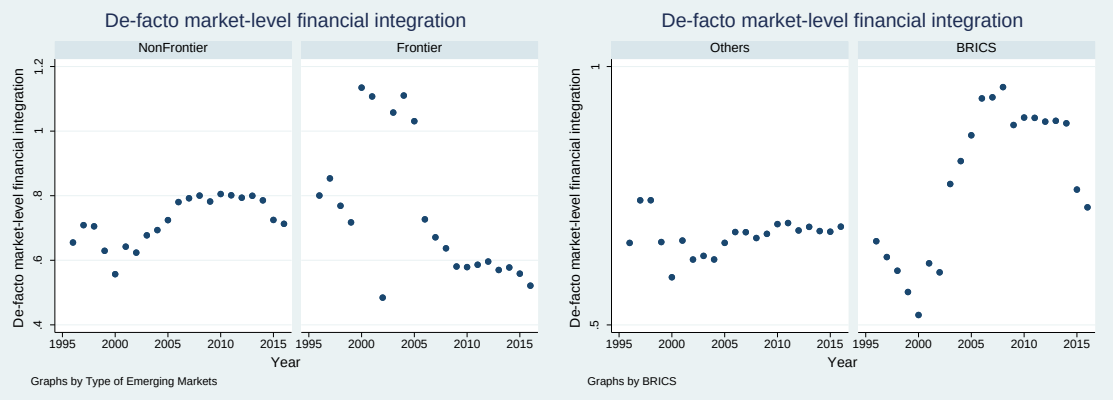

Figure 6

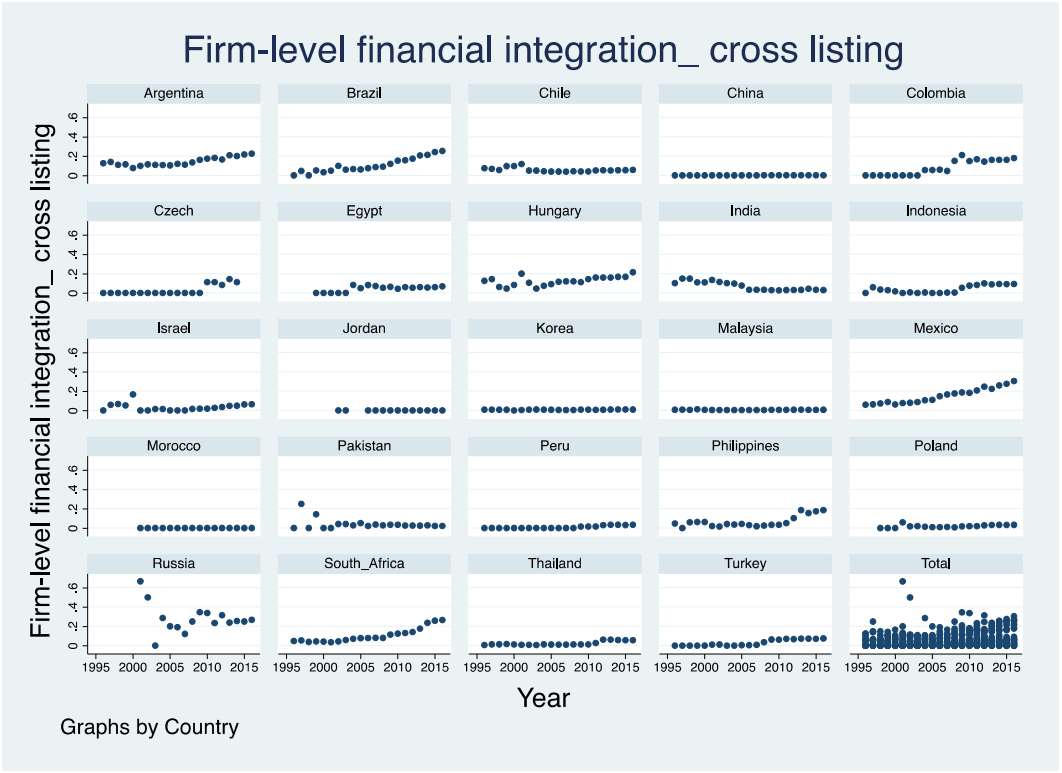

Figure 7